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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/781,820	02/12/2001	Bradley Paul Barber	L-122600	8550

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EXAMINER

ROCCHIGIANI, RENZO

ART UNIT PAPER NUMBER

2825

DATE MAILED: 04/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/781,820	Applicant(s) BARBER ET AL.	
	Examiner Renzo N. Rocchegiani	Art Unit 2825	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-4, 6-10 and 19-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-4, 6-10, 19-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 19, 3, 6 and 10 are rejected under 35 U.S.C. 102(b) as being anticipation by U.S. Patent No. 5,915,203 (Sengupta et al.).

Sengupta et al. disclose a method of depositing a non-conductive layer, i.e. SiO₂ (item 17) on a patterned titanium or aluminum electrode (item 15) and a substrate (item 11) and planarizing by CMP (col. 1, lines 65-67) the non-conductive layer so that the non-conducting layer has a height that is equal to the height of the patterned electrode. (Fig. 4).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4, 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,915,203 (Sengupta et al.) in view of U.S. Patent No. 5,324,683 (Fitch et al.).

As stated in paragraph 2, all the limitations of these claims have been met except for teaching that the substrate comprises silicon that the dielectric material is a low k material and that the planarization is done by polymer planarization.

Fitch et al. teaches a method of forming a semiconductor device comprising a substrate that may be of silicon (col. 5, lines 45-50) wherein it teaches that silicon dioxide is interchangeable with a low k dielectric (col. 5, lines 55-65) and wherein polymer planarization is interchangeable with CMP. (col. 8, lines 10-20).

It would have been obvious to one with ordinary skill in the art to combine the teachings of Fitch et al. to those of Sengupta et al., since Fitch et al. teaches the interchangeability of the material and process.

Furthermore it would have been obvious to one with ordinary skill in the art to use a substrate made of silicon, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 SUPQ 416.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,915,203 (Sengupta et al.) in view of U.S. Patent No. 4,885,262 (Ting et al.).

As stated in paragraph 2, all the limitations of these claims have been met except for teaching that the planarization is done by reflow and lift off.

Ting et al. teach that a dielectric may be planarized by reflow and/or lift-off process. (col. 1, lines 40-50).

It would have been obvious to one with ordinary skill in the art to planarize with reflow and lift-off, since Ting et al. teach that these are conventional and well known processes used in the art to planarize dielectric material. (col. 1, lines 40-50).

6. Claim 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,915,203 (Sengupta et al.) in view of U.S. Patent No. 5,739,563 (Kawakubo et al.).

As stated in paragraph 2, all the limitations of these claims have been met except for teaching that a piezoelectric material is deposited over the planarized surface.

Kawakubo et al. teach the formation of a support layer made of piezoelectric material (item 54) over a planar surface comprising a dielectric (item 50) and a titanium electrode. (item 53).

It would have been obvious to one with ordinary skill in the art to combine the teachings of Kawakubo et al. to those of Sengupta et al., since Sengupta et al. teaches a method to form integrated circuits eliminating step coverage problems and Kawakubo et al. teach the formation of an integrated circuit, thus one with ordinary skill in the art would be aware of the benefits in Sengupta et al. and be able to apply the process to the invention of Kawakubo et al. with an expectation of success.

Also, since the piezoelectric material is deposited over a planar surface, its mechanical integrity is inherently improved.

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,915,203 (Sengupta et al.) in view of U.S. Patent No. 5,739,563 (Kawakubo et al.) and in further view of U.S. Patent No. 5,552,655 (Stokes et al.).

As stated in paragraph 6, all the limitations of the claims have been met except for teaching that the piezoelectric material is made of AlN.

Stokes et al. teaches a structure comprising AlN piezoelectric. (col. 3, lines 59-64).

It would have been obvious to one having ordinary skill in the specific art to combine the teachings of Stokes et al. to those of Kawakubo et al. since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Response to Arguments

8. Applicant's arguments with respect to claims 2-4, 6-10 and 19-24 have been considered but are moot in view of the new ground(s) of rejection. The examiner points out that because all the language regarding the piezoelectric layer in claim 19 is found in the preamble with no reference thereto in the body of the claim, this limitation is not found to be limiting. Further support to the examiner's interpretation is the language in claim 20 wherein it states that the piezoelectric layer is deposited. In light of the newly discovered art the examiner has withdrawn the allowable subject matter. All pending claims stand rejected.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Renzo N. Rocchegiani whose telephone number is 571-272-1904. The examiner can normally be reached on Mon.-Fri. 8:00 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Renzo N. Rocchegiani
Examiner
Art Unit 2825



MATTHEW SMITH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800